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SOURCE Documentary as indicated. (Information specifically requested.)

RECENTLY PUBLISHED RESEARCH OF THE
INSTITUTE OF APPLIED CHEMISTRY, USSR

"Preparation of Sodium Thiosulfate by the Hydrogen Sulfide Method," Ya. I. Zilberman and V. M. Fridman (Leningrad State Inst Applied Chem)

"Zhur Priklad Khim" Vol 19, 1946, pp 55-62

In the reaction $2\text{Na}_2\text{SO}_3 + 2\text{NaHSO}_3 + 2\text{H}_2\text{S} = 3\text{Na}_2\text{S}_2\text{O}_3 \cdot 2\text{H}_2\text{O}$, optimum temperature is 20-40°. Yield is lowered by higher temperatures. Initial concentration of the reagents must be equimolar, as increase of either concentration by more than 10% leads to a serious drop of thiosulfate yield. Under above conditions the $\text{Na}_2\text{S}_2\text{O}_3$ yield is 95-6%. Mother liquors can be recycled in the process.

"Automatic Control of Lithopone Precipitation Process," T. M. Men'shikova and O. F. Klyuchko (State Inst Applied Chem)

"Khim Prom" No 10, 1946, pp 4-5

Lithopone production is controlled by a Bi-calomel pH meter.

"Water as an Oxidant in Pyrotechnic Mixtures," A. A. Shidlovskiy (Inst Applied Chem, Moscow)

"Compt Rend Acad Sci URSS" Vol 51, 1946, pp 131-3

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Mixture of Mg and Li (1:1) is explosive (S by) when subjected to intense heat, esp capable of combustion. Mg mixture can be detonated with a suitable primer, but the Al mixture cannot.

"Solubility in Water Systems $\text{NaCl}_2 + \text{MgSO}_4 \cdot 7\text{H}_2\text{O}$ + 2NaCl and $\text{CaCl}_2 + \text{MgSO}_4 \cdot 7\text{H}_2\text{O} + 2\text{NaCl}$," Ya. I. Zilberman and P. T. Ivanov (State Inst Applied Chem, Leningrad)

"Zhur Otechch Khim" Vol 16, 1946, pp 589-98

Solubility in water of $\text{Mg}_2\text{O}_3 \cdot 6\text{H}_2\text{O}$ was determined as a function of temperature at various levels; the solubility (decomposition into S + MgSO_4) first appears at 60° and is heavy; at 70° , it can be suppressed by the addition of a fraction of a percent of MgSO_4 ; solubility then continues to rise with temperature, reaching 45% at 95.75° . Indication of melting in the crystalline water is found at 920 with some decomposition; solutions containing up to 32% Mg_2O_3 can be boiled without decomposition. For the reciprocal salt system, compositions of the eutonic solutions $\text{MgCl}_2\text{-MgSO}_4\text{-H}_2\text{O}$, $\text{Na}_2\text{S}_2\text{O}_3\text{-MgSO}_4\text{-H}_2\text{O}$, $2\text{NaCl}\text{-MgSO}_4\text{-H}_2\text{O}$, $\text{Na}_2\text{S}_2\text{O}_3\text{-H}_2\text{O}$, $2\text{NaCl}\text{-MgCl}_2\text{-H}_2\text{O}$, at 25° (table) and the contours of the crystalline fields of MgCl_2 , $\text{MgSO}_4 \cdot 6\text{H}_2\text{O}$, and $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$ (graph) are given. No new solid phases are found. Solubility of $\text{CaS}_2 \cdot 5\text{H}_2\text{O}$ increases linearly with the temperature. Turbidity appearing from 300 upwards cannot be suppressed by CaSO_4 nor by additions of Mg_2O_3 and CaCl_2 ; saturation with $\text{Ca}(\text{OH})_2$ permits reaching 350° but not higher. $\text{CaS}_2 \cdot 5\text{H}_2\text{O}$ decomposed readily on dissolving and on standing. The ternary system $\text{CaCl}_2\text{-CaS}_2 \cdot 5\text{H}_2\text{O}$ revealed a new solid phase, identified as $\text{CaS}_2 \cdot 5\text{H}_2\text{O}$ by its $\text{CaS}_2 \cdot 5\text{H}_2\text{O}$ content, crystallographically homogeneous, $n_d^{20} 1.645$, n_d^{25} more than 1.760 as against 1.417 for the hexahydrate; after 4 months' standing over HgSO_4 , latter was converted into the monohydrate which is stable for months, always giving clear solutions. The 250° isotherm triangle is given. For the reciprocal salt pair, composition of eutonic solutions (table) and boundaries of crystallization fields (graph) at 25° are given.

"Preparation and Properties of Some Thiosulfatoargentates: III. Magnesium Sodium Salt," Ya. I. Zilberman and I. L. Krem'nikova (State Inst Applied Chem, Leningrad)

"Zhur Otechch Khim" Vol 16, 1946, pp 591-6

Possibility of isolation of crystalline Mg thiosulfatoargentates from aqueous solution is shown. Mg Na salt is synthesized; and analytical procedure for such compounds is developed. AgCl from AgNO_3 solution is added to a solution of MgSO_4 in water; after the particles of AgCl disappear,

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ixture is diluted with BrCH₂MeOH mixture and allowed to stand overnight to yield products which range from 43.0% to 43.54% S₂O₃ and contain 29.57% Ag and 4.35% I₂. The initial thiosulfate contains small amounts of Na; the products contain all of this Na in the form of the double salt. Complete analysis of the mixtures indicates a composition close to Na₂Ag₂S₂O₃ (320/13). Salt is readily soluble in water, MeOH, NH₄OH, and H₂S₂O₃ and is quantitative titrated with iodine. Salt is very stable in the dry state, while solutions in water decompose on standing, especially on heating. It was determined by precipitating an AgCl by a stream of Cl passed into aqueous solution of the salt.

"The Preparation and Properties of Some Thiosulfatocontaining Magnesium Salts," I. L. Khomitskaya and Ya. I. Litvberman (State Inst Applied Chem, Leningrad)

"Zhur Obshch Khim" Vol 15, 1945, pp 718-23

Pure AgCl is dissolved in a solution of MgS₂O₃, containing not more than 0.05-0.1% Na, and a solution of MeOH and EtOH (1:2) is added. Ratio of MeOH to volume of Ag-containing solution should be 1:1. Resulting oil precipitate is separated and redissolved in MeOH. Addition of twice the volume of EtOH precipitates crystalline Mg₂Ag₂(S₂O₃)₃·H₂O. Unless the ratios of solvents are exact, an impure product is obtained. Salt is stable in the cold but is decomposed by sulfides, Cl, boiling H₂O, or heat. If it is allowed to stand in MeOH solution, it decomposes to insoluble K₂[Ag(S₂O₃)₂·3H₂O, which is less stable and decomposes to Ag₂S on standing. Both salts lose H₂O on crystallization over CaCl₂.

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